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4/28/08

## WP 1.1

# Specifying Initial Conditions for Forecasting When Retrospective Pattern is Present

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GARM III Biological Reference Points Meeting  
Woods Hole  
28 April – 2 May 2008

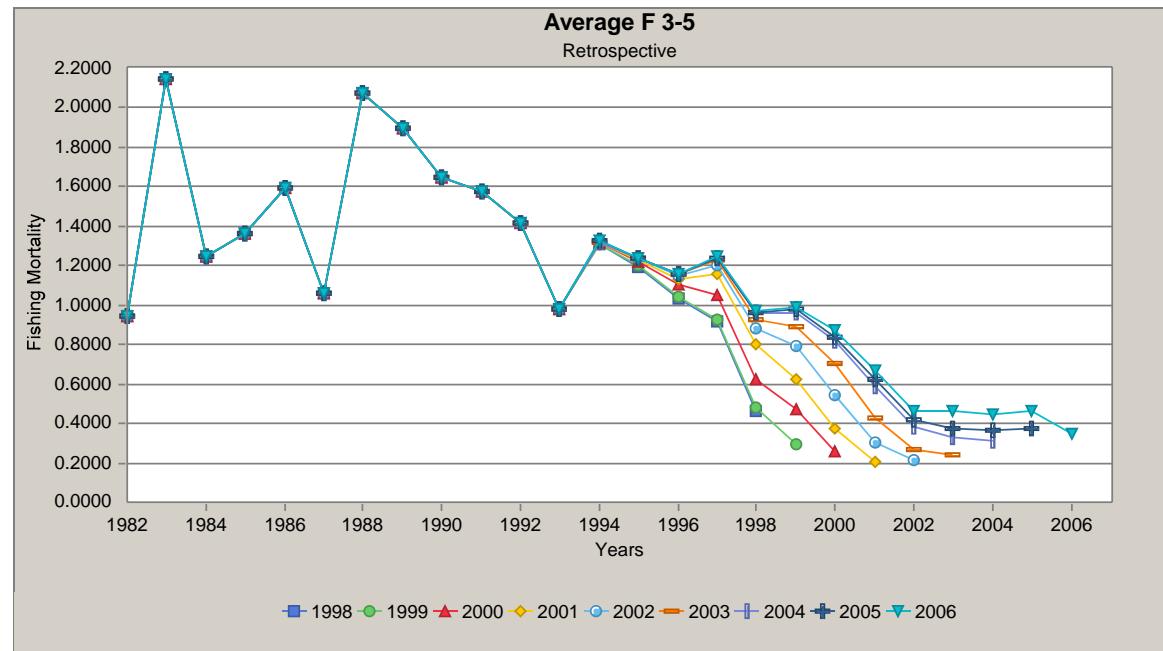
# Addresses TOR 1

- *For relevant stocks, determine the influence of retrospective patterns in parameter estimates (e.g., fishing mortality, biomass, and/or recruitment) from assessment models on the computation of BRPs and on specification of initial conditions for forecasting.*

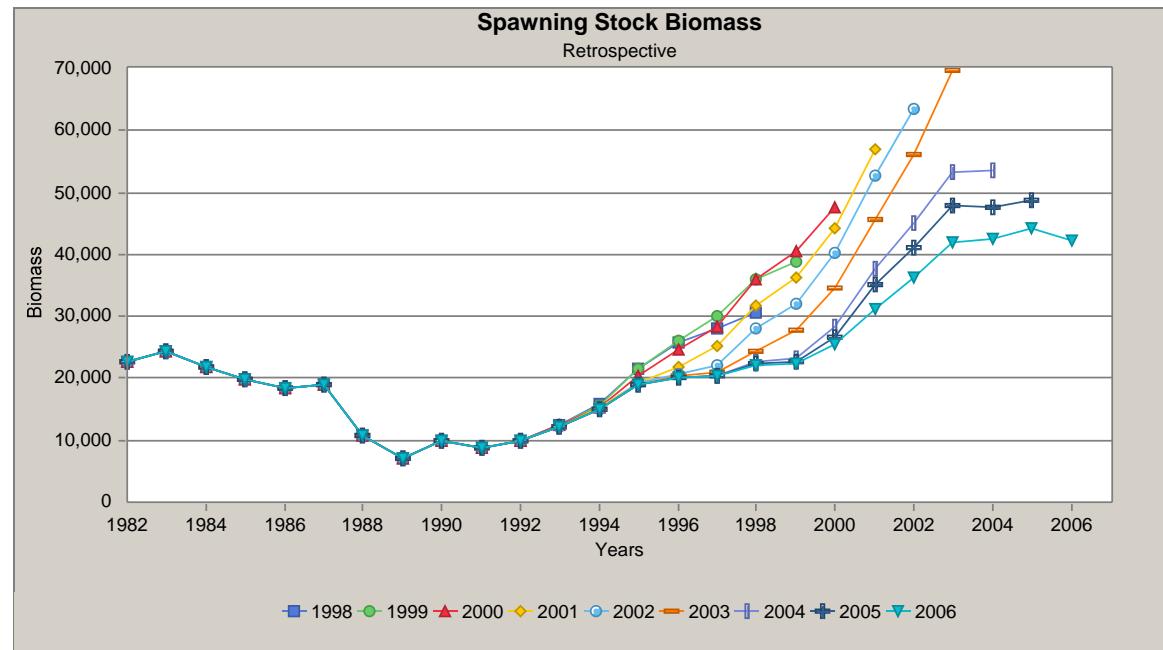
# Why?

- Presence of a retrospective an indication that something is wrong with model
- GARM3 Methods Meeting showed many ways to adjust models/data to reduce retro
- Alternative is to keep assessment with retro and make adjustment in projections

# Retro



Age	Retro Change
0	4.80%
1	4.80%
2	-4.20%
3	-0.40%
4	-6.00%
5	3.20%
6	-65.50%
7	-26.80%



5 yr avg of single year update

# How?

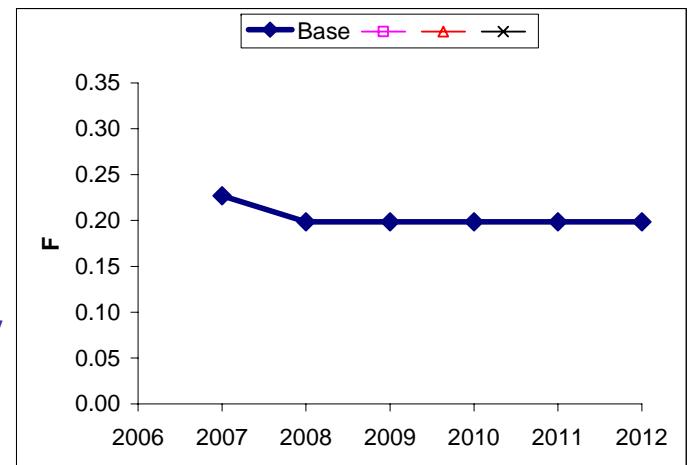
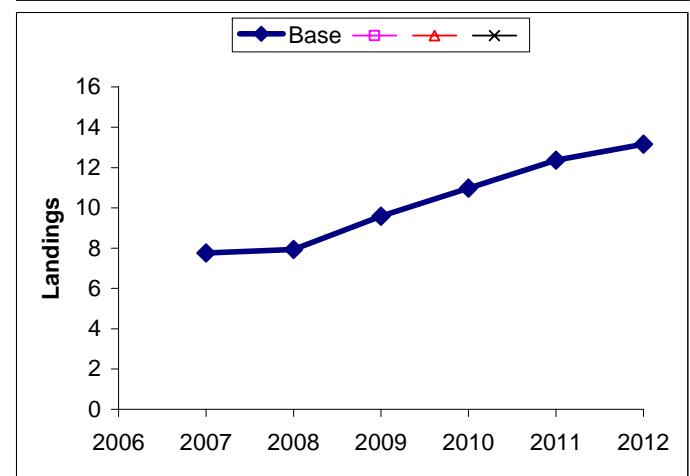
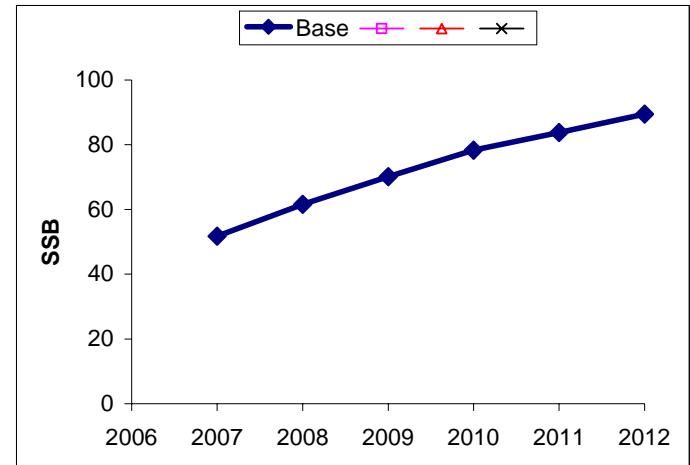
- Two types of approaches considered
  - Adjust TAC (or F)
  - Adjust NAA (from bootstraps)
    - Same adjustment for all ages
    - Age-specific adjustments
- Technical Issues
  - One step or full adjustment
  - Number of years to average (5)

# Base (No Adjustment)

Spawning Stock Biomass (thousand metric tons)	
Year	Base
2007	51.719
2008	61.535
2009	70.123
2010	78.314
2011	83.796
2012	89.411

Landings (thousand metric tons)	
Year	Base
2007	7.762
2008	7.936
2009	9.583
2010	10.982
2011	12.366
2012	13.155

Fishing Mortality Rate	
Year	Base
2007	0.227
2008	0.198645
2009	0.198645
2010	0.198645
2011	0.198645
2012	0.198645



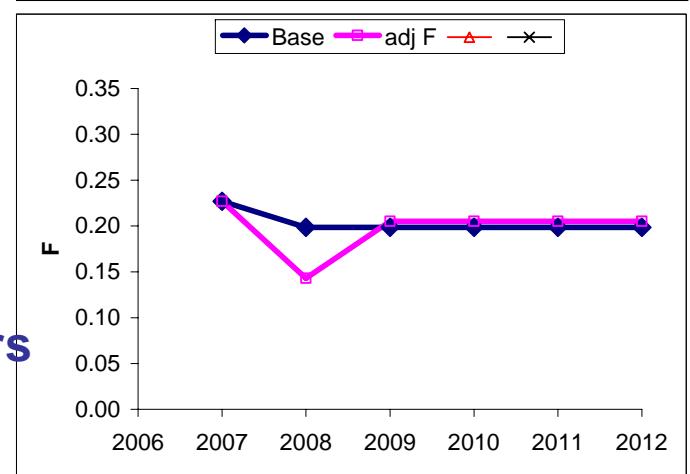
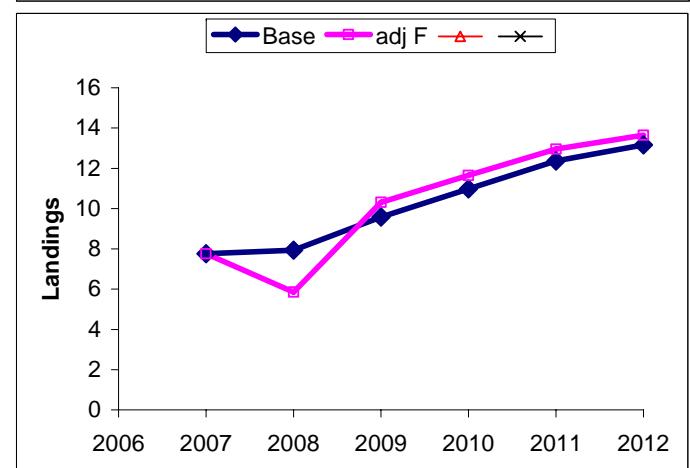
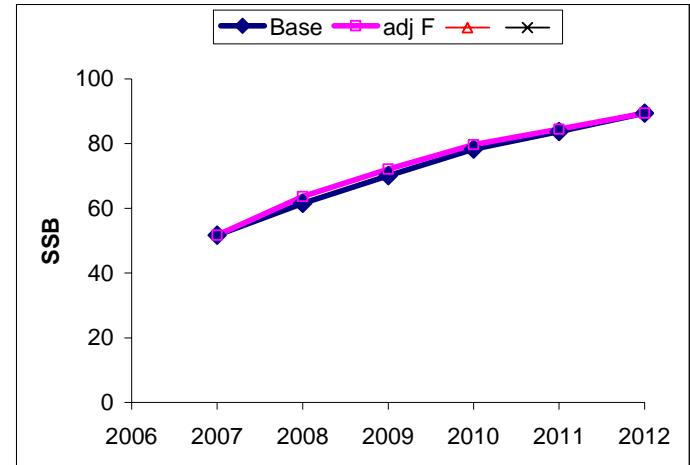
Catch in 2007 fixed, solve for F to achieve SSB<sub>msy</sub> in 2012 with 50% probability

# Adjust F

Spawning Stock Biomass (thousand metric tons)		
Year	Base	adj F
2007	51.719	51.719
2008	61.535	63.644
2009	70.123	72.113
2010	78.314	79.666
2011	83.796	84.457
2012	89.411	89.411

Landings (thousand metric tons)		
Year	Base	adj F
2007	7.762	7.762
2008	7.936	5.851
2009	9.583	10.312
2010	10.982	11.643
2011	12.366	12.957
2012	13.155	13.644

Fishing Mortality Rate		
Year	Base	adj F
2007	0.227	0.227
2008	0.198645	0.1430244
2009	0.198645	0.205265
2010	0.198645	0.205265
2011	0.198645	0.205265
2012	0.198645	0.205265



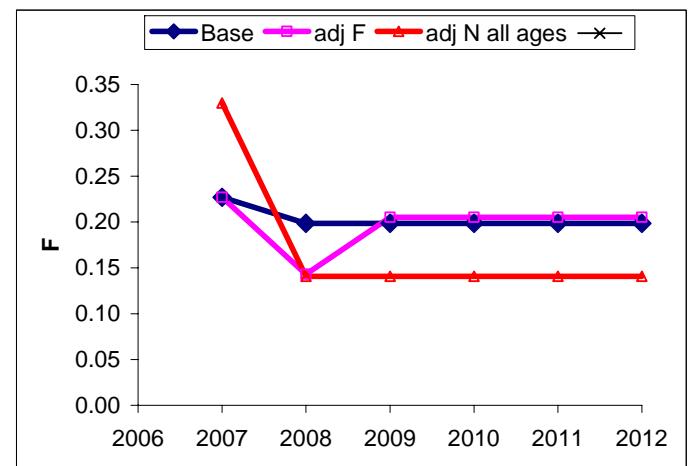
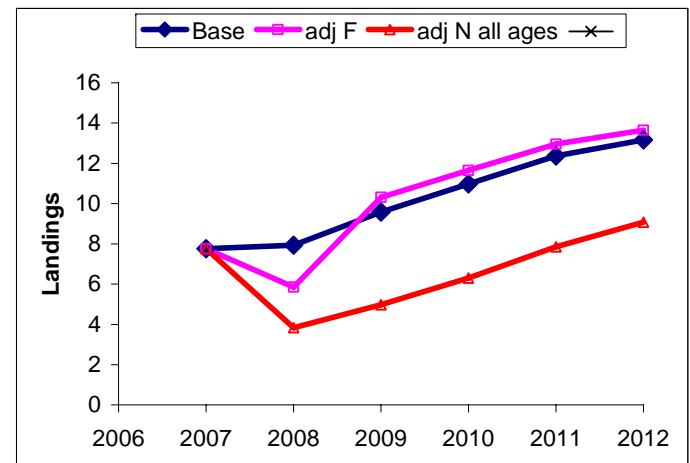
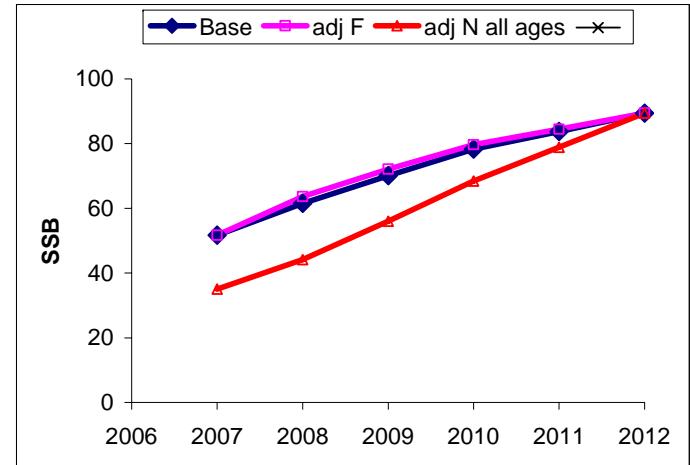
Reduce F2008 by 28%, solve for F in remaining years  
 One year decline in catch, then increase in catch  
 F2009-2012 increased relative to Base

# Adjust NAA All Ages

Spawning Stock Biomass (thousand metric tons)			
Year	Base	adj F	adj N all ages
2007	51.719	51.719	35.068
2008	61.535	63.644	44.193
2009	70.123	72.113	56.044
2010	78.314	79.666	68.438
2011	83.796	84.457	78.846
2012	89.411	89.411	89.411

Landings (thousand metric tons)			
Year	Base	adj F	adj N all ages
2007	7.762	7.762	7.762
2008	7.936	5.851	3.831
2009	9.583	10.312	4.976
2010	10.982	11.643	6.303
2011	12.366	12.957	7.849
2012	13.155	13.644	9.069

Fishing Mortality Rate			
Year	Base	adj F	adj N all ages
2007	0.227	0.227	0.330
2008	0.198645	0.1430244	0.14069
2009	0.198645	0.205265	0.14069
2010	0.198645	0.205265	0.14069
2011	0.198645	0.205265	0.14069
2012	0.198645	0.205265	0.14069



Reduce NAA start of 2007 by 28%,  
solve for F in remaining years, major hit in catch  
F2009-2012 increased relative to Base

# Adjust NAA By Age

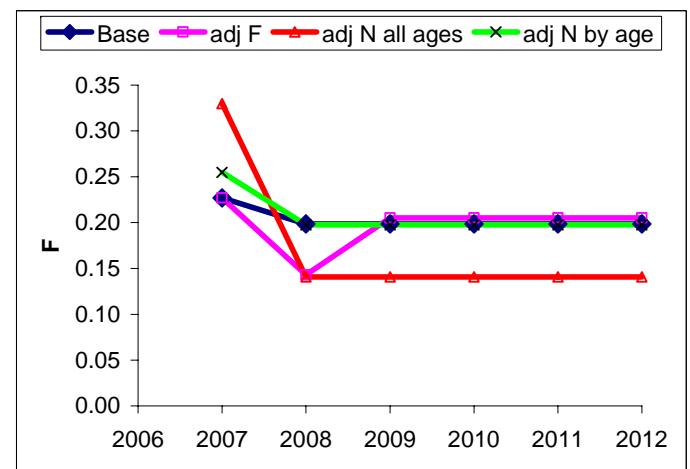
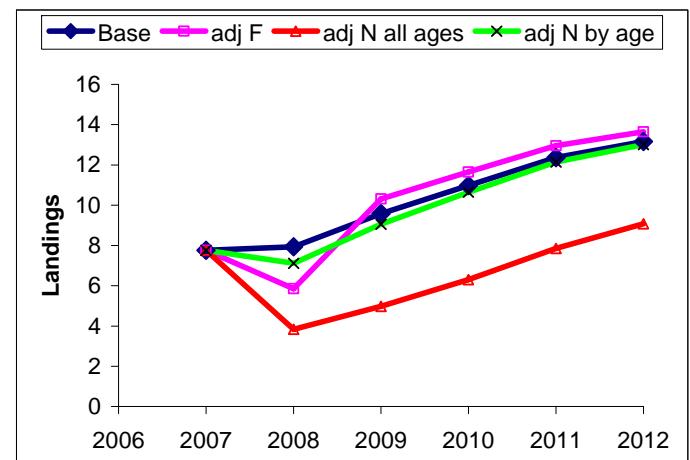
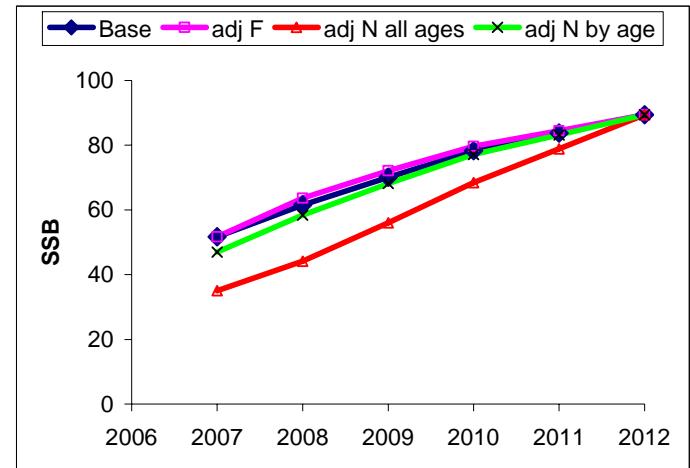
Spawning Stock Biomass (thousand metric tons)				
Year	Base	adj F	adj N all ages	adj N by age
2007	51.719	51.719	35.068	47.005
2008	61.535	63.644	44.193	58.433
2009	70.123	72.113	56.044	68.188
2010	78.314	79.666	68.438	77.169
2011	83.796	84.457	78.846	83.219
2012	89.411	89.411	89.411	89.411

Landings (thousand metric tons)				
Year	Base	adj F	adj N all ages	adj N by age
2007	7.762	7.762	7.762	7.762
2008	7.936	5.851	3.831	7.108
2009	9.583	10.312	4.976	9.048
2010	10.982	11.643	6.303	10.644
2011	12.366	12.957	7.849	12.145
2012	13.155	13.644	9.069	13.013

Fishing Mortality Rate				
Year	Base	adj F	adj N all ages	adj N by age
2007	0.227	0.227	0.330	0.255
2008	0.198645	0.1430244	0.14069	0.197615
2009	0.198645	0.205265	0.14069	0.197615
2010	0.198645	0.205265	0.14069	0.197615
2011	0.198645	0.205265	0.14069	0.197615
2012	0.198645	0.205265	0.14069	0.197615



Reduce NAA start of 2007 by age specific amounts, solve for F in remaining years, minor hit in catch F2009-2012 slightly lower relative to Base

# Conclusions

- Adjusting TAC only not recommended when examining rebuilding plan
- Adjusting all ages the same will overadjust when age-specific retros differ
- Adjusting by age produced relatively minor changes in this example
  - Old age retros “wash out” quickly
- Simulation studies needed